

# 2004 WxAP Project Review

Follow-on Aviation Weather Safety  
Research Session:  
Open Floor Discussion

Friday, June 4, 2004

10:00 AM - 12:00 PM

# OPEN FLOOR DISCUSSION

- Ernie Dash (Raytheon/FAA FISDL) asked the kickoff question:
  - For the follow-on program, it appears that Cockpit Weather Display/Flight Deck Presentation & Interface research will be done in separate project than the rest of the weather research; does that mean we will need to coordinate with two separate projects/workshops in the future?
    - Gus (NASA Glenn) agreed that the follow-on program is being organized more along ‘competencies’ than towards end-to-end products (as the current program is). As such, integration and communication with the end-user community will be more of a challenge; but it can work.
    - Dan Baize (NASA Langley) volunteered to brief the group on planning status of his project, Integrated Flt Deck Information Systems, to help provide perspective on approach of flight deck research in follow-on program.
- A presentation on “Human Error Avoidance & Mitigation Group 3-B” was presented by Dan Baize. The presentation was a report out from a recent Industry Workshop held on 3/4/04. Dan pointed out that Paul Stough (NASA Langley) is one of the planning team members for the follow-on program. As such, given Paul’s involvement in the current Wx project – this should provide continuity in the follow on. Flight deck human factors input can be given to either Paul or Dan.
  - Dan was asked:
    - Have you developed products? Yes.
    - What is the next step? To get industry feedback from forums like this. Guidelines are being worked.
- How does the Joint Planning Development Office (JPDO) Weather activity impact the planning process? Mark Anderson (NOAA NWS; Co-chair of JPDO Weather Team) answered with a presentation to the group.
  - JPDO in existence since last year. They have a report due December 12, 2004 covering what JPDO has accomplished to date and plans to accomplish in the future. The JPDO will enable national leadership for future NAS initiatives; it has a dedicated emphasis on Weather (among other areas). Question was raised concerning the impact of JPDO decisions on member agencies.
  - JPDO focuses on the US strategic plan (national scope). Curb to Curb, not just gate to gate perspective. Performance goals of 25% reduction of users cost, 30% reduction transit time (includes security), increase capacity of the system. To consider future demand in cargo, micro-jets, UAV’s and GA. Aggressive goals. Also consider distributed databases of departments, and changing business models. For instance, they will be looking to answer the following question: Is hub and spoke dead? What are impacts of non hub-and-spoke models on the airspace?
  - JPDO Teams are drafting national plans (e.g. end to end system for weather) (Vol. 1). Vision/goals will be Vol. 2. and will cover what has to be done. Themes in document are not unlike what NASA presented this morning. JPDO themes:
    - Improvements in airspace weather Situational Awareness (a common ops picture)
    - Create 5D database for weather. Understand roles of automated systems vs. the forecaster. Integrated database with future decision support systems.
    - Need/emphasis on training (this is a major national short-fall)
  - JPDO weather is trying to get 5-6 agencies on the same page. Create a system level understanding and a plan at national level.
  - It is proposed that an interagency weather office would be led by the FAA. Such a concept (for a national office) was endorsed via a national study in 1995. Weather has a high level of interest and will be scrutinized due to synergism of agency work.
  - The JPDO will act as a ‘filter’ for federal agency weather work. It is envisioned that in order to pass OMB review, the JPDO will need to endorse agency proposal/plan.

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- To invigorate further dialogue, Gus M. asked the group “are we on the right course (with the planning)?...does the NASA plan (presented earlier this morning) capture our group’s viewpoints?”
- Jim Joyce (Honeywell) asked: “Is weather communications item an unfunded activity, please clarify?” (with respect to in-guide, funded priorities vs. over-guide, unfunded activities).
  - Gus reply:
  - This is a programmatic decision. Because the weather communications area has seen much success over the past few years, there’s a perception that NASA’s done. You can get this impression if you look at systems from XM Satellite and Bendix King. In the March industry review industry did voice that more work needs to be done; but the program office to date feels this work is done and there’s no need for additional research in the follow on program. It is important to note that NASA has high budget pressures due to things like higher infrastructure costs, security research funding that also contribute to the priorities being set as such. It is the NASA weather planning team’s position, based on what we’re hearing via forums like this, that weather communications research is not done. We will continue to carry this message back to the program office.
- The group supported the 4G/5G aviation cellular research area. There were comments that this could be an area that could have significant positive impact on aviation for a modest NASA research investment. (Kathy Kearns of SITA and J. Joyce of Honeywell expressed support).
- Rob Harshaw (Heads U) could not attend the 3<sup>rd</sup> day, but passed on his comments to Gus M. with regards to observations on current NASA program and future plans.
  - Rob was concerned that NASA’s work in cockpit Wx displays (studies, simulations, flight experiments..) was at risk of not having any impact or value to industry. The industry is implementing systems now and no one’s is going to wait for NASA. The NASA work may be eclipsed by industry activities.
  - NASA needs to strongly leverage commercial systems/development in designing future aviation systems. Aviation is not a driver in the grand scheme of things and aviation needs to leverage synergies in the consumer/commercial sector.
  - The aviation cellular area was a good initiative and NASA should continue research in this area (it follows the sentiments expressed above)
- Ernie Dash: In the current program, there is an FAA-NASA MoA for Weather. Could this instrument be used/updated to help NASA with its research in the follow on program (especially for areas NASA doesn’t have funding for)? Will NASA be able to use it?
  - Gus commented that NASA would greatly welcome inter-agency joint support to backfill unfunded/underfunded research efforts.
- Kathy Kearns with SITA asked, “It was mentioned that there wasn’t WINCOMM project work in the future budget...and industry is concerned. Are there plans being worked to get this changed? There’s great concern and need to understand how best to handle various information going to and from aircraft with some of it for tactical use. There’s especially a real need to understand the suitability of various comm links in light of the diverse type of information and its end-use in diverse decision-making.”
  - Gus commented that NASA would like to at least do some low level study work to understand these questions. It’s unclear if there’s any funding to do anything in the WINCOMM area as mentioned earlier.

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- Walt Rogers (NWS CWSU Center Weather Service Unit):
- How are we to get information around?
  - There's missing on NASA's priority list the need for collaborative decision making for ground people (dispatch, ATC...) We need to put out products that all parties can agree on given weather impacts the NAS system. We need to consider the full spectrum of ground users in the NAS for weather.
    - Gus commented that in the current program, early on due to resource constraints, NASA focused on airborne users. There are other sister NASA programs in planning such as TNAS in the Airspace Systems Program that, if funded, will have a big weather air traffic management system focus on ground users. Steve Green from NASA Ames, who is at this Review, is a good person to talk to about this. Also, Mary Wadel of NASA Glenn is also involved in the planning of TNAS Weather and is a good person to talk to.
    - Mary Wadel (NASA Glenn) commented that NASA is trying to pursue augmentation funding for the TNAS initiative with focus on changing the NAS and looking at the research gaps. Weather has been identified as an area to work across programs; that it is integrated.
- Comment by Kevin Johnston (NOAA NWS) on the need for optimization for TAMDAR. This is a new capability and an end-end system optimization needs to be done to compare this new capability to current methods.
- The group asked for NASA to look at priorities and gauge/assess what relative areas in weather should be weighted for focus (turbulence, ash, lightning...). There is a need, given the funding constraints, to understand the safety benefits associated with addressing the different weather hazards. A good system engineering/safety-benefit analysis should be done to get this understanding.
- Comments were offered that NASA should look at the ionized radiation hazard in the follow-on. An integrated weather product could be put together of different products at different levels, take advantage of existing models/data.
- Comment given that synchronization/coordination between NASA and Industry research needs to be maintained and increased.
- Ron Means (Boeing Avionics Integration and Communication) stated that he was encouraged by this conference. He welcomed the NASA's work on what should be integrated into the cockpit, how big the communication links should be... these are good areas to look at and the industry needs guidance for them. This workshop has been beneficial in terms of this type of guidance and for where Boeing should be focusing its work.

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- Ernie Dash stated that he appreciated the great work the NASA team has accomplished to date and looks forward to work in the future with the weather team. He also acknowledged Gus' personal leadership in the success to date. He congratulated Gus on behalf of the industry attendees attending the Review.
- Scott ?, brought up that there are training issues with weather information—and this is a gap area. He was concerned of how to use information strategically by ground users and pilots. Asked about training for pilots and who's job it is to create training programs.
  - Ernie Dash responded mentioning the FAA has “low-end” GA training activities. But for business jet and the micro jet community there is a gap.
  - FAA (Dash) confirmed that this is an issue. Training responsibility is under the Flt Standards arena in the FAA.
  - Gus and Mary Wadel commented that NASA Ames, as part of their human factors research program, does have an active training development program for pilots. In additions, with respect to in-flight icing, NASA Glenn has been developing training aids (via computer CDs and such) for pilots as part of the NASA Aviation Safety Program.
- Jim Joyce (Honeywell) provided a response to Rob Harshaw's comments and added comments from Honeywell's perspective.
  - Jim commented that NASA's research in cockpit Wx displays is very valuable and well synchronized. He felt the research being done behind implementation of weather products, such as weather dissemination and presentation is pretty new and even if pockets of it is being implemented by industry, the research still needs to occur.
  - Jim was asked what is Honeywell's basis of their implementation and how NASA's work factors in? Jim commented that Honeywell's development schedule is dependent on NASA's research results (he cited the work NASA is doing in NEXRAD looping and future enhancements to Bendix-King Wx displays).
  - With respect to weather communications, Jim wanted to balance views expressed by Dr. Harshaw by noting that there's risk with depending too much on consumer/commercial links. There is a need to be careful that the links being developed for cabin/passenger use may not be appropriate for cockpit applications. Cabin links may only be able to serve advisory types of services where cockpit apps in the future will require critical information and cabin links may not be suitable. Also, there are risks with being tied too much to commercial ventures (especially if the venture fails).
  - He greatly supported NASA's proposed work in aviation cellular for the follow-on and Honeywell would be very disappointed if NASA did not continue its development in this area (very promising work with great potential).
- Gerry Preziotti (JH/APL) written input:
  - There is a need for comm work in the future. Current Wx comm systems provide a limited set of products. As the NAS moves towards integrated databases of information including weather, there is an emerging need for ways to link aircraft to these ground based databases. The current generation of systems will not meet this need. Initial research needs to be done for transformational comm systems to meet the needs of the future.
- Aviation Cellular additional input (unknown source):
  - Commercial aviation cellular must have broad service provider as well as user base to minimize business changes by any single entity. Avionics would be aviation specific not commercial cellular phones.
  - AvCellular is being discussed with FAA Certification identifying the needs and requirements for a C/D level of cert. First meeting was held at the I-CNS conference in April, 2004.